Final Report
Intensive Multiwavelength Monitoring of PKS 2155–304
NASA Grant NAG5-2499

Principal Investigator: C. Megan Urry
Space Telescope Science Institute
3700 San Martin Drive
Baltimore, MD 21218

Period Covered: March 1994 through February 1996

This is a final report to the National Aeronautics and Space Administration (NASA) concerning NASA grant NAG5-2499. This grant was awarded to Dr. C. Megan Urry of the Space Telescope Science Institute in response to a successful IUE proposal to carry out "Intensive Multiwavelength Monitoring of PKS 2155–304," a UV-bright BL Lacertae object which exhibits extremely rapid variations. This grant provided very minimal support for this work, which was carried out by myself and post-doc Joe Pesce.

The grant was awarded on 3/3/94; this report covers the period through February 1996, at which points funds have been completely expended.

Our intensive multiwavelength monitoring of the BL Lacertae object PKS 2155-304 in May 1994 was extremely successful. The collected data represent the best simultaneous multiwavelength light curves ever obtained for any AGN, because of the broad wavelength coverage, the high sampling rate, and the long duration. Our analysis of these data is nearing completion, and we have three papers about to be submitted to refereed journals.

The following invited review papers and/or book chapters were based in part on work supported by this grant:

- "Blazars, the Most Violent Active Galaxies" C. M. Urry, 1996, AAAS Annual Meeting and Science Innovation Exposition, 162nd National Meeting of the AAAS, ed. Michael S. Strauss, et al., p. S-48
- " An Overview of Blazar Variability" C. M. Urry, 1996, in *Blazar Variability*, (Proc. Conference in Miami, February 1996), ed. J. Webb, in press

In addition, we have given talks at or submitted abstracts for conferences as listed below:

- "Multiwavelength Observations of PKS 2155-304 during May 1994: The Ground-based Campaign" J. E. Pesce, C. M. Urry, and L. Maraschi, 1996, in*Blazar Variability*, (Proc. Conference in Miami, February 1996), ed. J. Webb

- " Multiwavelength Monitoring of the BL Lac Object PKS 2155-304. The May 1994 IUE Campaign" E. Pian, C. M. Urry, L. Maraschi, et al., 1996, *Blazar Variability*, (Proc. Conference in Miami, February 1996), ed. J. Webb

- "Observations of Blazars with ASCA" F. Makino, R. Edelson, R. Fujimoto, T. Kii, E. Idesawa, K. Makishima, T. Takahashi, K. Sasaki, T. Kamae, H. Kubo, D. Mathis, M. Tashiro, H. Teräsranta, and C. M. Urry, 1995, in *Roentgenstrahlung in the Universe*, (Proc. Rosat Conf., Wurzburg, Sep 1995), in press

- "Rapid Multiwavelength Flaring of the BL Lac Object PKS 2155–304" C. M. Urry, J. E. Pesce, R. M. Sambruna, A. Treves, E. Pian, L. Maraschi, T. Kii, K. Sasaki, F. Makino, R. Fujimoto, C. Otani, F. Makino, M. Tashiro, T. Takahashi, H. Marshall, G. Madejski, S. Penton, and J. M. Shull, 1995, BAAS, 26, 1467

- "Multiwavelength Observations of the BL Lac Object PKS 2155–304" J. E. Pesce, C. M. Urry, R. M. Sambruna, A. Treves, E. Pian, L. Maraschi, T. Kii, K. Sasaki, F. Makino, R. Fujimoto, M. Tashiro, H. Marshall, G. Madejski, S. Penton, and J. M. Shull, 1994, in *The Multi-Mission Perspective* (High Energy Astrophysics Division Meeting of the American Astronomical Society, Napa Valley, November 1994), p. 107

Work under this grant has been completed; alternative support will be enlisted to complete additional papers on the multiwavelength variability data and interpretation.

FINAL PATENT/INVENTION REPORT

Principal Investigator: Dr. C. Megan Urry

Grant : NAG5-2499

Patents/Inventions Developed: NONE